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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,656	09/29/2003	Takehiro Nakamura	15689.49.2	2350

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EXAMINER	
GREY, CHRISTOPHER P	
ART UNIT	PAPER NUMBER
2416	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/673,656	NAKAMURA ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER P. GREY	2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,12,13 and 15-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,12,13 and 15-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/5/09 has been entered.

Response to Amendment

2. In view of applicant's amendment filed on 6/5/09 the status of the application is still pending with respect to claims 7, 12-13 and 15-17.

Response to Arguments

3. Applicant's arguments with respect to claims 7, 12-13 and 15-17 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 7, 12, 13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (US 5912931), hereinafter referred to as Mat in view of Baker et al. (US 5067139), hereinafter referred to as Baker.

Regarding Claim 7, Mat discloses a first communication apparatus **(fig 9 shows transmission system)** comprising:

means **(fig 9 shows a transmitter)** for generating a signal **(fig 7 shows a generated signal)**, which has a frame **(fig 7, where the frame is 60 symbols long according to Col 10 lines 4-10)** comprising a plurality of slots **(fig 7, where each subcarrier/SC is equivalent to a slot)**, and includes one or more known pilot symbols **(fig 7, where P's 41 are equivalent to pilot symbols)** and one or more sync words **(fig 7, see unique word/UW)** in each of the slots **(fig 7, where each subcarrier/SC is equivalent to a slot, and fig 7 shows 4 slots).**

means for transmitting the signal **(fig 9 shows transmission system)**

the second communication apparatus **(fig 10a shows receiver)**

means for receiving the signal **(fig 10a shows receiver)**

means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the pilot symbols included in the signal **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

sync words included in the signal **(fig 7 see UW, unique words equivalent to sync words)**

wherein the means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** carries out coherent detection **(Col 7 lines 3-6 shows coherent**

detectors) by using the pilot symbols and the sync words **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

Mat does not specifically disclose the sync word for frame synchronization **(however it is clear from the use of "Sync" word, that such data is used for synchronization)**, means for establishing frame synchronization by using the sync words and carrying out coherent detection after frame synchronization is established.

Baker discloses the sync word **(fig 3, 301 shows a sync word)** for frame synchronization **(Col 2 lines 30-35, where the sync word is used for frame synchronization)**, means **(see fig 1, 112 and 102, where each symbol of the sync word is mixed with the NCO in order to synchronize by removing the frequency offset according to Col 5 lines 10-20)** for establishing frame synchronization **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** by using the sync words **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** and carrying out coherent detection **(see fig 1 for coherent detection)** after frame synchronization **(fig 1, where the mixing of the received signal with the NCO is equivalent to frame synchronization, and this mixing is the first process done in the coherent detection, thus the completion of coherent detection is achieved after this process of synchronization)** is established.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the coherent detector disclosed by Mat, as taught by Baker, since stated in Col 1 lines 30-35, that such a modification will fulfill the need for a

coherent detector that can determine the initial constellation point rapidly and track the rotating constellation.

Regarding Claim 12, Mat discloses means **(fig 10a shows a receiver)** for receiving a signal **(fig 7 shows a generated signal)**, which has a frame **(fig 7, where the frame is 60 symbols long according to Col 10 lines 4-10)** comprising a plurality of slots **(fig 7, where each subcarrier/SC is equivalent to a slot)**, and includes one or more known pilot symbols **(fig 7, where P's 41 are equivalent to pilot symbols)** and one or more sync words **(fig 7, see unique word/UW)** in each of the slots **(fig 7, where each subcarrier/SC is equivalent to a slot, and fig 7 shows 4 slots).**

means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the pilot symbols included in the signal **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

Sync words included in the signal **(fig 7 see UW, unique words equivalent to sync words)**

wherein the means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** carries out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the pilot symbols and the sync words **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

Mat does not specifically disclose the sync word for frame synchronization **(however it is clear from the use of "Sync" word, that such data is used for synchronization)**, means for establishing frame synchronization by using the sync words and carrying out coherent detection after frame synchronization is established.

Baker discloses the sync word **(fig 3, 301 shows a sync word)** for frame synchronization **(Col 2 lines 30-35, where the sync word is used for frame synchronization)**, means **(see fig 1, 112 and 102, where each symbol of the sync word is mixed with the NCO in order to synchronize by removing the frequency offset according to Col 5 lines 10-20)** for establishing frame synchronization **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** by using the sync words **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** and carrying out coherent detection **(see fig 1 for coherent detection)** after frame synchronization **(fig 1, where the mixing of the received signal with the NCO is equivalent to frame synchronization, and this mixing is the first process done in the coherent detection, thus the completion of coherent detection is achieved after this process of synchronization)** is established.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the coherent detector disclosed by Mat, as taught by Baker, since stated in Col 1 lines 30-35, that such a modification will fulfill the need for a coherent detector that can determine the initial constellation point rapidly and track the rotating constellation.

Regarding Claim 13, Mat discloses a first communication apparatus **(fig 9 shows transmission system)** comprising:

means **(fig 9 shows a transmitter)** for generating a signal **(fig 7 shows a generated signal)**, which has a frame **(fig 7, where the frame is 60 symbols long according to Col 10 lines 4-10)** comprising a plurality of slots **(fig 7, where each**

subcarrier/SC is equivalent to a slot), and includes one or more known pilot symbols **(fig 7, where P's 41 are equivalent to pilot symbols)** and one or more sync words **(fig 7, see unique word/UW)** in each of the slots **(fig 7, where each subcarrier/SC is equivalent to a slot, and fig 7 shows 4 slots).**

means for transmitting the signal **(fig 9 shows transmission system)**

the second communication apparatus **(fig 10a shows receiver)**

means for receiving the signal **(fig 10a shows receiver)**

means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the pilot symbols included in the signal **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

sync words included in the signal **(fig 7 see UW, unique words equivalent to sync words)**

wherein the means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** carries out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the pilot symbols and the sync words **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

Mat does not specifically disclose the sync word for frame synchronization **(however it is clear from the use of "Sync" word, that such data is used for synchronization)**, means for establishing frame synchronization by using the sync words and carrying out coherent detection after frame synchronization is established.

Baker discloses the sync word **(fig 3, 301 shows a sync word)** for frame synchronization **(Col 2 lines 30-35, where the sync word is used for frame**

synchronization), means **(see fig 1, 112 and 102, where each symbol of the sync word is mixed with the NCO in order to synchronize by removing the frequency offset according to Col 5 lines 10-20)** for establishing frame synchronization **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** by using the sync words **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** and carrying out coherent detection **(see fig 1 for coherent detection)** after frame synchronization **(fig 1, where the mixing of the received signal with the NCO is equivalent to frame synchronization, and this mixing is the first process done in the coherent detection, thus the completion of coherent detection is achieved after this process of synchronization)** is established.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the coherent detector disclosed by Mat, as taught by Baker, since stated in Col 1 lines 30-35, that such a modification will fulfill the need for a coherent detector that can determine the initial constellation point rapidly and track the rotating constellation.

Regarding Claim 15, Mat discloses receiving a signal **(fig 7 shows a generated signal)**, which has a frame **(fig 7, where the frame is 60 symbols long according to Col 10 lines 4-10)** comprising a plurality of slots **(fig 7, where each subcarrier/SC is equivalent to a slot)**, and includes one or more known pilot symbols **(fig 7, where P's 41 are equivalent to pilot symbols)** and one or more sync words **(fig 7, see unique word/UW)** in each of the slots **(fig 7, where each subcarrier/SC is equivalent to a slot, and fig 7 shows 4 slots).**

means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the pilot symbols included in the signal **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

sync words included in the signal **(fig 7 see UW, unique words equivalent to sync words)**

wherein the means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** carries out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the pilot symbols and the sync words **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

Mat does not specifically disclose the sync word for frame synchronization **(however it is clear from the use of "Sync" word, that such data is used for synchronization)**, means for establishing frame synchronization by using the sync words and carrying out coherent detection after frame synchronization is established.

Baker discloses the sync word **(fig 3, 301 shows a sync word)** for frame synchronization **(Col 2 lines 30-35, where the sync word is used for frame synchronization)**, means **(see fig 1, 112 and 102, where each symbol of the sync word is mixed with the NCO in order to synchronize by removing the frequency offset according to Col 5 lines 10-20)** for establishing frame synchronization **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** by using the sync words **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** and carrying out coherent detection **(see fig 1 for coherent detection)** after frame synchronization **(fig 1, where the mixing of the received**

signal with the NCO is equivalent to frame synchronization, and this mixing is the first process done in the coherent detection, thus the completion of coherent detection is achieved after this process of synchronization) is established.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the coherent detector disclosed by Mat, as taught by Baker, since stated in Col 1 lines 30-35, that such a modification will fulfill the need for a coherent detector that can determine the initial constellation point rapidly and track the rotating constellation.

Regarding claim 16, Mat discloses wherein the means for generating includes a pilot symbol portion **(fig 7, see P data for pilot symbols)** and a sync word portion **(fig 7, see UW for unique word portions, which is equivalent to sync words)** alternately **(see fig 7 which shows a UW alternately followed by a P)** at fixed intervals **(Col 4, lines 56-67, show that the symbols are periodically embedded within the data, and UW is at the beginning of the data)** in each of the slots **(fig 7, see slots 1-Nf)** in the signal **(fig 7 shows the symbols/signals being transmitted).**

Regarding claim 17, Mat discloses wherein the means for generating includes a pilot symbol portion **(fig 7, see P data for pilot symbols)** and a sync word portion **(fig 7, see UW for unique word portions, which is equivalent to sync words)** alternately **(see fig 7 which shows a UW alternately followed by a P)** at fixed intervals **(Col 4, lines 56-67, show that the symbols are periodically embedded within the data, and UW is at the beginning of the data)** in each of the slots **(fig 7, see slots 1-Nf)** in the signal **(fig 7 shows the symbols/signals being transmitted).**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER P. GREY whose telephone number is (571)272-3160. The examiner can normally be reached on 10AM-7:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Moe Aung can be reached on (571)272-7314. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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